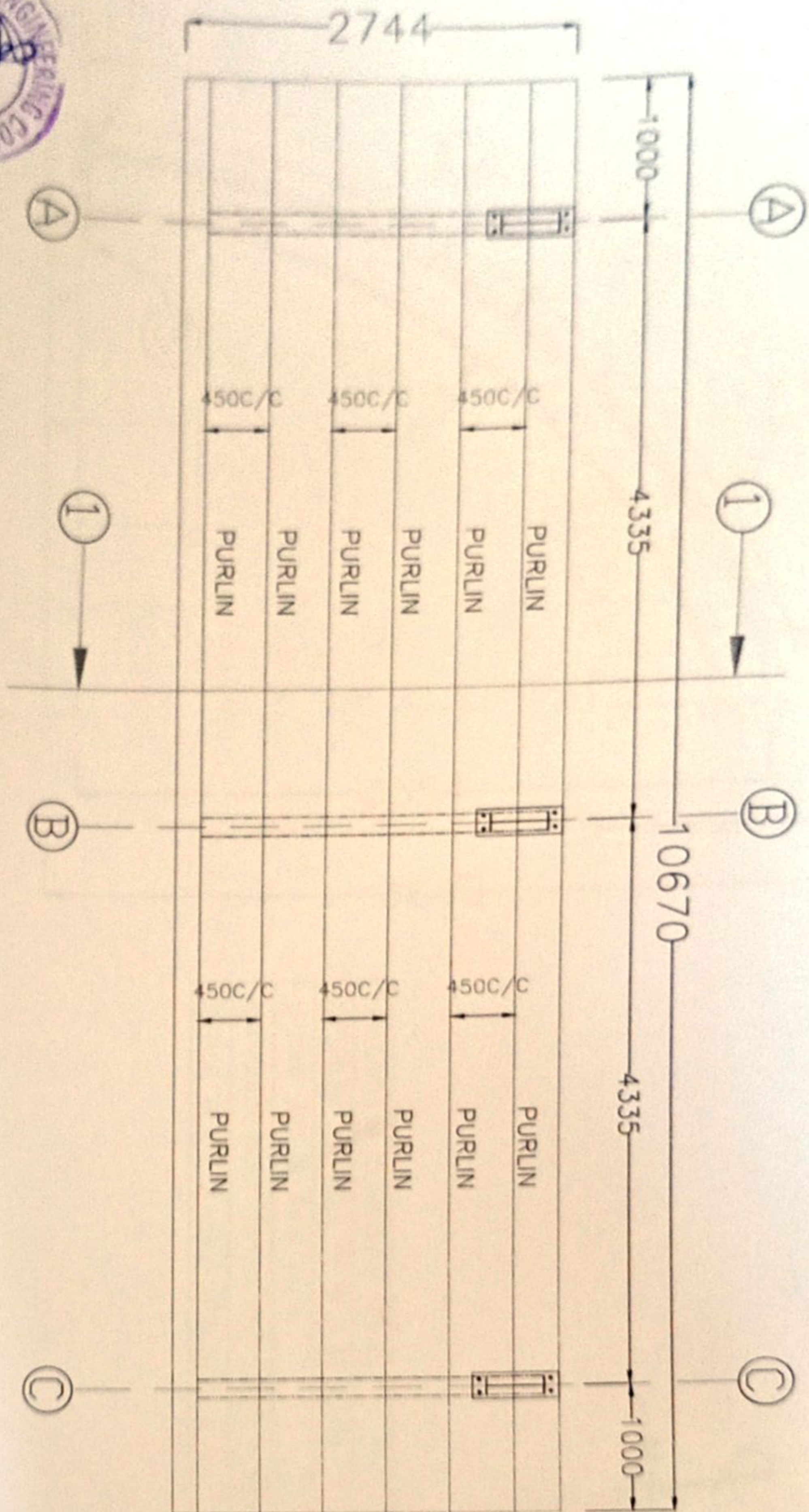
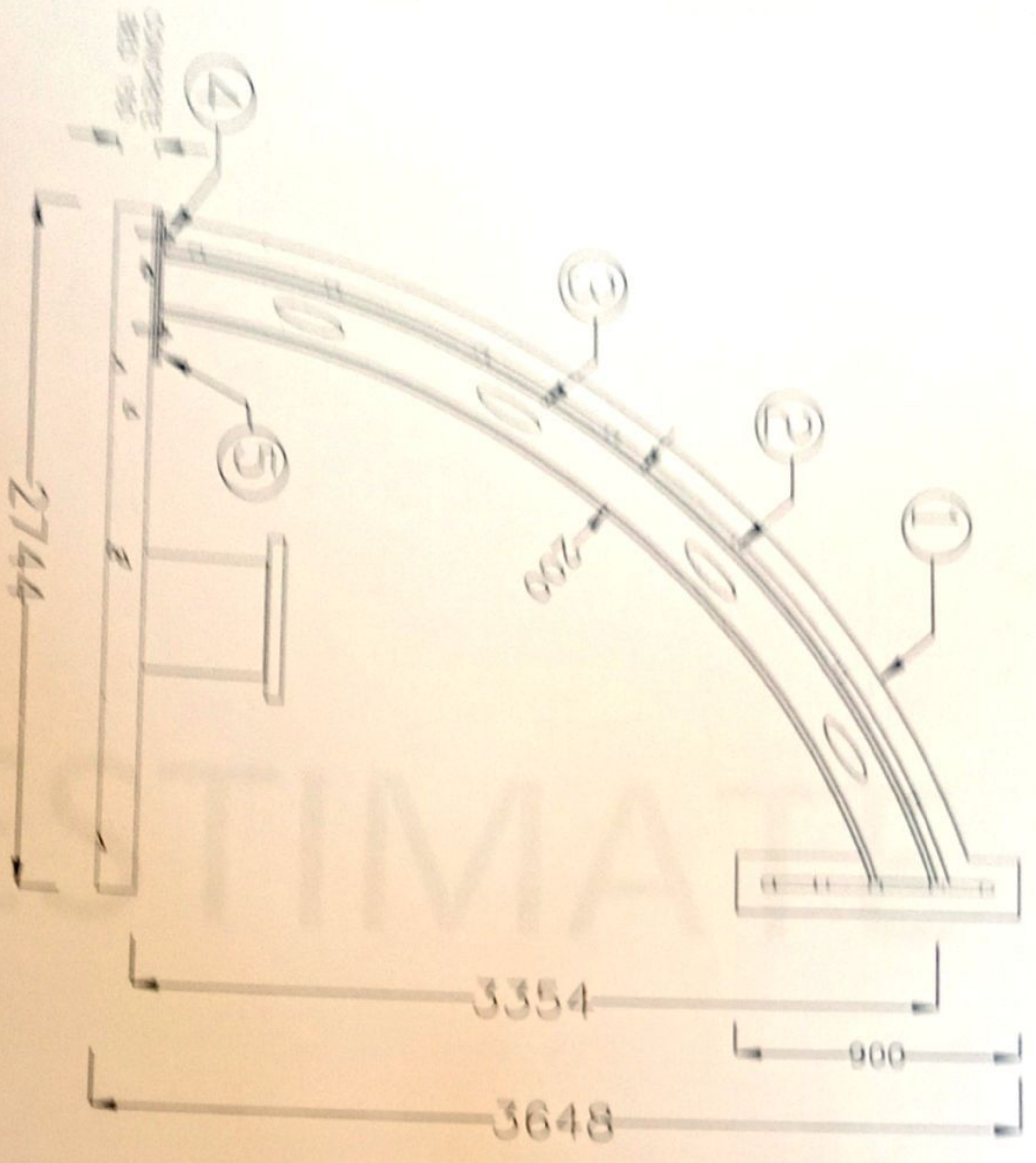




PLAN

SECTION 1-1

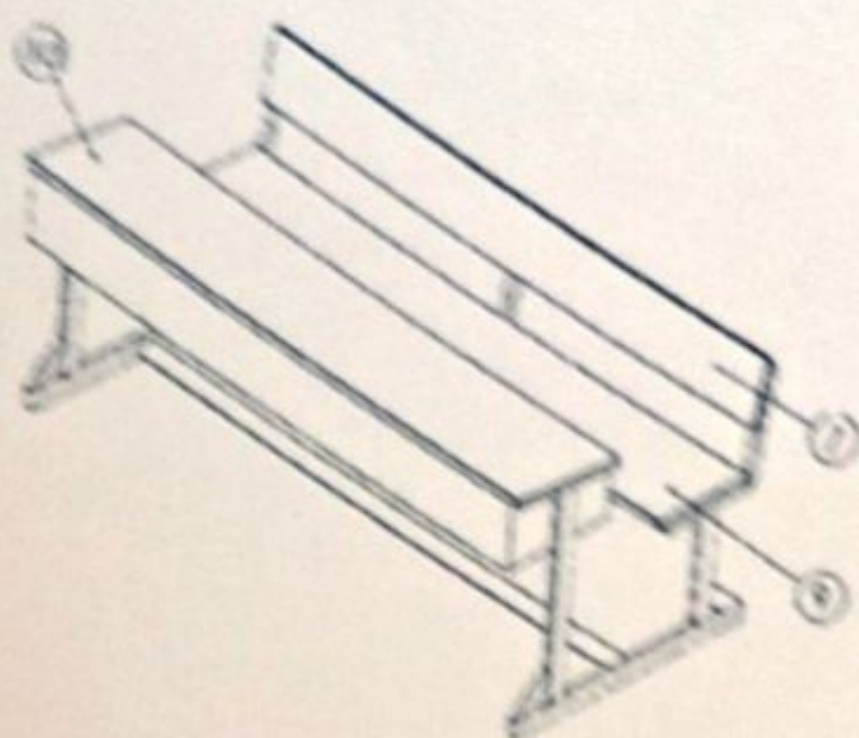


1	ALUMINUM COMPOSITE PANEL
2	PURLIN 50X40X4 TH @ 8.36 kg/m
3	ISMB 200 @ 54.6 kg/m
4	ANCHOR BOLT 16 DIA 600 LONG 4 NOS
5	BASE PLATE 2 NOS 600X300X16 TH

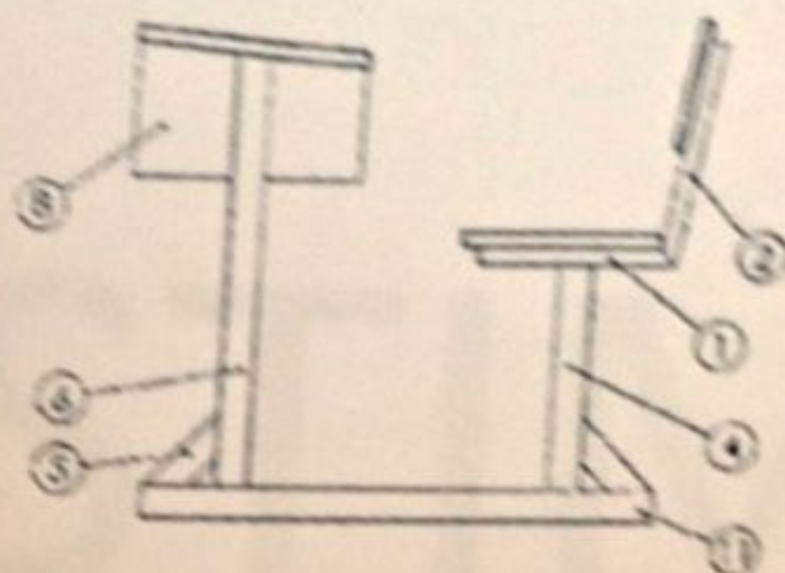
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Appendix 1: Technical Specifications,
For Government Engineering Colleges and Government Polytechnics.
FIVE SEATER STUDENT DESK / DUEL DESK



ITEM NO.	PART NUMBER	QTY.
1	25 X 25 X 1.6 THK CHOD TUBULAR SECTION	5
2	25 X 25 X 1.6 THK CHOD TUBULAR SECTION VERTICAL	3
3	25 X 30 X 1.6 THK BOTTOM TUBULAR SECTION	1
4	25 X 30 X 1.6 THK CHOD TUBULAR SECTION	2
5	25 X 30 X 1.6 THK TUBULAR SECTION	4
6	25 X 30 X 1.6 THK TUBULAR SECTION	2
7	Back rest plate 1830 X 204 X 18	1
8	Book Shelf - 1830 X 355 X 203 (1.2mm thick sheet)	1
9	Sitting plank 1830 X 304 X 25	1
10	Writing plank 1830 X 355 X 25	1
11	25 X 30 X 1.6 THK BOTTOM TUBULAR SECTION 2	2



Size: 1830 mm L x 787 mm D x 755 mm H

Under-structure:

Made using combination of Rectangular & Square tubular section.
Rectangle Tube used for bottom runner, vertical & gusset: 50x25x1.6 mm thick
Square Tube used for top, seat & back support: 25x25x1.6 mm thick
Book storage box made using 1.2 mm thick CRCA Sheet
Size: 1755 mm L x 325 mm D x 200 mm H
Finish: Powder coated (As per customer choice)
Type of structure: Modular / Welded
Legs and open ends of tube will be fitted with end caps & Leg bush

Wooden Parts:

Size:
Top: 1830 mm x 354 mm x 25 mm thick
Seat: 1830 mm x 304 mm x 25 mm thick
Back Rest: 1830 mm x 204 mm x 18 mm thick
Top & Seat: Made using 25 mm thick BWR grade with IS 303:1989
Back: Made using 18 mm thick BWR grade with IS 303:1989
Finish: Plywood will be pressed with 1mm thick laminate on both side and all exposed edges will be sealed with 2mm thick PVC Edge banding tape
Shade: Rosewood

14

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EXECUTIVE ENGINEER BBMP	June 11 2022
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2ND CROSS VEERABADRASWAMY TEMPLE NARASAIHINA AGRAHARA VELAHANKA BANGALORE
EL 1892 SURFACE INVESTIGATION FOR FOUNDATIONS
JAMES : 30330009

Technical Report

Geotechnical Investigation Report

Deccan Engineers India

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NO	DESCRIPTION	NO. OF PAGES.	PAGE NO
1	DETAILS OF INVESTIGATIONS	14	14
2	RECOMMENDATION	1	15
3	SITE PLAN	1	16
4	SBC FOR EACH BORE	3	19
5	BORE LOG	1	20
6	LAB TEST RESULTS	1	21
7	TABLE B	1	22
8	SBC CALCULATION	2	24
9	IMAGES	5	29
	TOTAL PAGES		29



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1 INTRODUCTION:

M/s Deccan Engineers India Executed the work of soil investigation at site.

2 OBJECTIVE OF GEOTECHNICAL INVESTIGATIONS :-

- To obtain information on the physical properties of soil a site to design earthworks and foundations for proposed structures and for repair of distress to earthworks and structures caused by subsurface conditions.
- To surface exploration and subsurface exploration of a site. To conduct laboratory tests of the soil samples retrieved.

3 SCOPE

The work include mobilization of necessary equipment, providing necessary engineering supervisors and technical personnel, skilled and unskilled labour as required to carry out field investigations and tests, laboratory tests and analysis and interpretation of data and results, preparation of a detailed geotechnical report.

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15-10-92 SUBSURFACE INVESTIGATION FOR FOUNDATION

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M/s Deccan Engineers India Executed the work of soil investigation at site.

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4 PURPOSE

- To determine type of substrata and their characteristics.
- To enable an adequate and economic design to be prepared.
- To plan the best method of construction to foresee and provide against difficulties and delays that may arise during construction due to ground and other local conditions. To determine the changes that may arise in the ground and environmental conditions, either naturally or as a result of the proposed works, and the effect of such changes on adjacent works and on the environment in general. To explore sources of indigenous materials for use in construction. The number and type of specified tests, revision in the depth of boreholes, samples collected.

FIELD INVESTIGATION**Bore holes Explorations:**

The most common method used to obtain soil details directly is to drill a borehole. To estimate the engineering properties, plasticity etc.

Standard Penetration Test:- SPT.

The Standard Penetration Tests aims to determine the SPT N value, which gives an indication of the soil stiffness and can be empirically related to many engineering properties.

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Purpose of Standard Penetration Test :- SPT.

- The main purpose of the test is to provide an indication of the relative density of granular deposits, such as sands and gravels from which it is virtually impossible to obtain undisturbed samples.
- The great merit of the test and the main reason for its widespread use is that it is simple and inexpensive. In conditions where the quality of the undisturbed sample is suspect, e.g. very silty or very sandy clays, or hard clays, it is often advantageous to alternate the sampling with standard penetration tests to check the strength. The usefulness of SPT results depends on the soil type, with fine-grained sands giving the most useful results, with coarser sands and silty sands giving reasonably useful results,

Disturbed Samples: - DS

Disturbed soil samples were taken at every 1.5m interval and at significant change of stratum. Disturbed samples were be placed without delay in LD 300 mg covers of standard size of 0.4kg also labeled and packed before sending to laboratory.

Undisturbed soil samples were taken at significant change of stratum.

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Method of conducting Standard Penetration Test SPT.

➤ Standard Penetration test was conducted in accordance to IS 2131 using a standard split spoon sampler (51mm OD & 38 mm ID & length of 650 mm) driven by 63.50 kg drop weight tripping automatically with a free fall of 750 mm. The number of hammer blows required to drive 150mm of the sample is counted. The sampler is further driven by 150mm and the number of blows recorded. Likewise the sampler is once again further driven by 150mm and the number of blows recorded. The number of blows recorded for the first 150mm is disregarded. The number of blows recorded for the last two 150mm intervals are added to give the standard penetration resistance Value 'N'.

SPT Refusal & 'N' Correction

➤ Refusal means when the sampler penetrates less than 2.5 cm under 50 blows. The SPT 'N' value is corrected for dialtancy correction and over burden pressure correction. Soil Samples were collected in LD 300 mg covers of standard size also labeled and packed before sending to laboratory.

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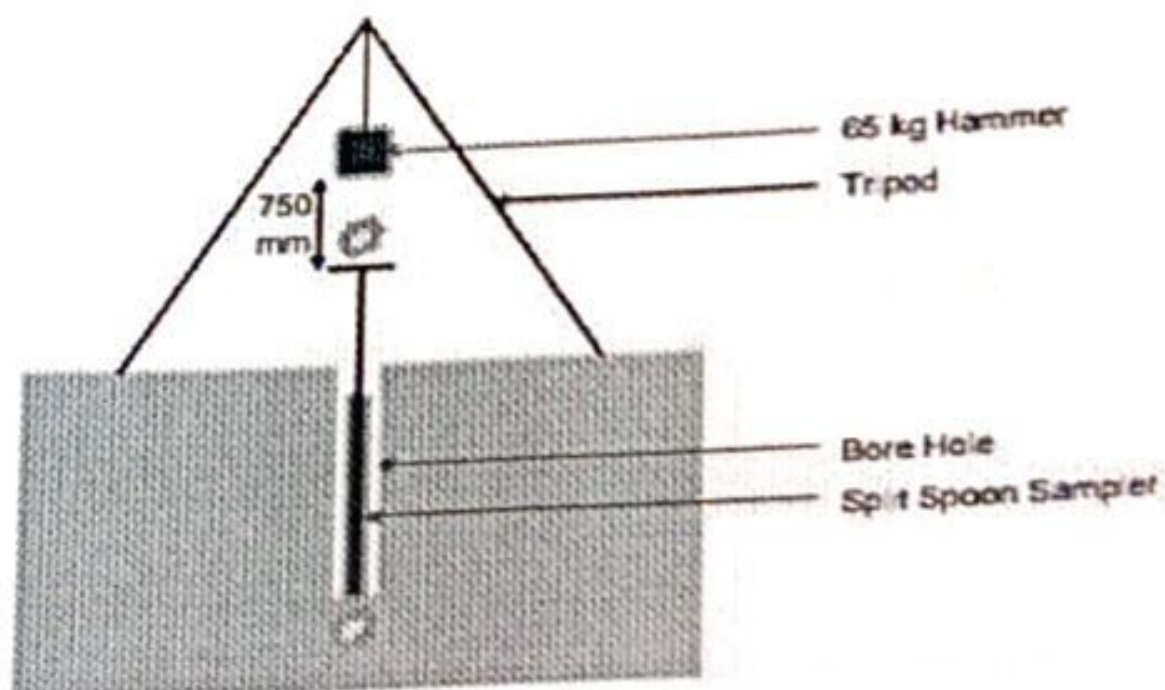
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The standard penetration resistance:

The standard penetration resistance shall be determined as per IS : 2131 -1981 at a number of selected points at intervals of 75 cm in the vertical direction or change of strata if it takes place earlier and the average value beneath each point shall be determined between the level of the base of the footing and the depth equal to 1.5 to 2 times the width of foundation. In computing the average any individual value more than 50 percent greater than the average shall be neglected, but the values for all loose seams shall be included.

The ultimate net bearing capacity shall be calculated from following formula:

$$\sigma [Nq - 1] Sq \times dq + \frac{1}{2} B \gamma \times N\gamma \times S\gamma \times d\gamma \times R_w$$

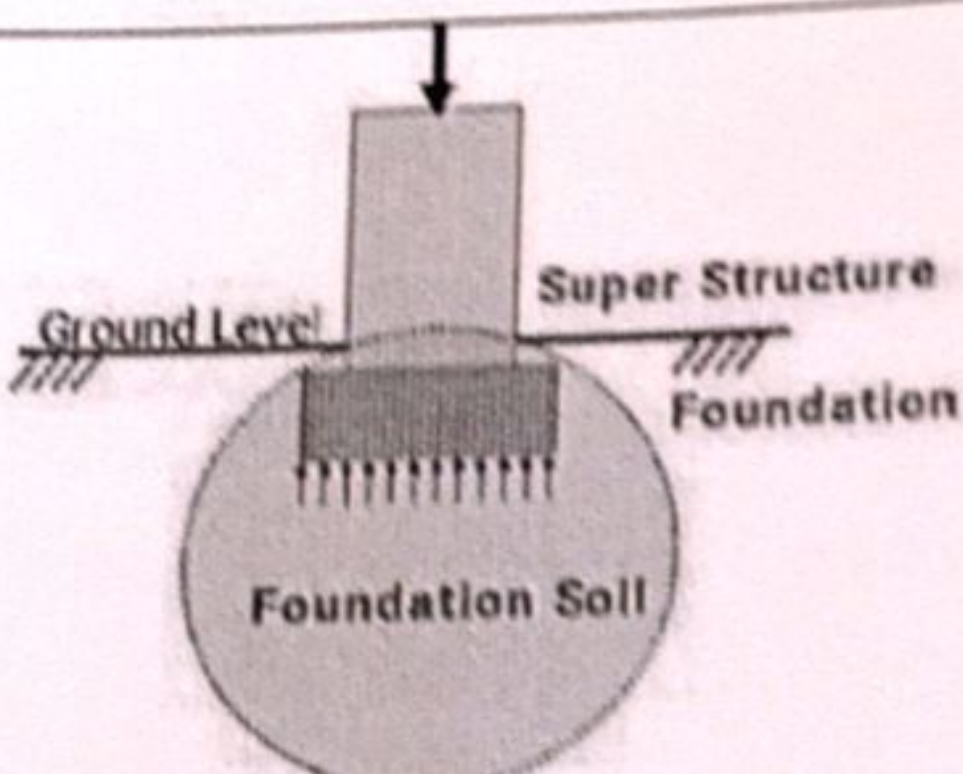


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Boring
Boring was carried out 150 mm dia
This report is limited to max depth of 6m or SPT 50 whichever is earlier.
This report is subjected to monsoon climatic change.

BEARING CAPACITY OF SOIL
Bearing capacity is the power of foundation soil to hold the forces from the superstructure without undergoing shear failure or excessive settlement. Foundation soil is that portion of ground which is subjected to additional stresses when foundation and superstructure are constructed on the ground. The following are a few important terminologies related to bearing capacity of soil.


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Ultimate Bearing Capacity (q_f) :

It is the maximum pressure that a foundation soil can withstand without undergoing shear failure

Net ultimate Bearing Capacity (q_n) :

It is the maximum extra pressure (in addition to initial overburden pressure) that a foundation soil can withstand without undergoing shear failure.

$$q_n = q_f - q_0$$

Here, q_0 represents the overburden pressure at foundation level and is equal to γD for level ground without surcharge where γ is the unit weight of soil and D is the depth to foundation bottom from Ground Level.

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Safe Bearing Capacity (q_s) :

It is the safe extra load the foundation soil is subjected to in addition to initial overburden pressure.

$$q_s = \frac{q_n}{F} + q_o$$

Here, F represents the factor of safety

Allowable Bearing Pressure (q_a) :

It is the maximum pressure the foundation soil is subjected to considering both shear failure and settlement.

Foundation

Is that part of the structure which is in direct contact with soil. Foundation transfers the forces and moments from the super structure to the soil below such that the stresses in soil are within permissible limits and it provides stability against sliding and overturning to the super structure. It is a transition between the super structure and foundation soil. The job of a geotechnical engineer is to ensure that both foundation and soil below are safe against failure and do not experience excessive settlement. Footing and foundation are synonymous.

Concept

A strip footing of width B gradually compresses the foundation soil underneath due to the vertical load from superstructure. Let q_f be the final load at which the foundation soil experiences failure due to the mobilization of plastic equilibrium. The foundation soil fails along the composite failure surface and the region is divided into five zones, Zone 1 which is elastic, two numbers of Zone 2 which are the zones of radial shear and two zones of Zone 3 which are the zones of linear shear. Considering horizontal force equilibrium and incorporating empirical relation, the equation for ultimate bearing capacity is obtained as follows.

$$\text{Ultimate bearing capacity, } q_f = cN_c + \gamma DN_q + 0.5\gamma BN_\gamma$$

If the ground is subjected to additional surcharge load q , then

$$q_f = cN_c + (\gamma D + q)N_q + 0.5\gamma BN_\gamma$$

Net ultimate bearing capacity,

$$q_n = cN_c + \gamma DN_q + 0.5\gamma BN_\gamma - \gamma D$$

$$q_n = cN_c + \gamma D(N_q - 1) + 0.5\gamma BN_\gamma$$

$$\text{Safe bearing capacity, } q_s = \left[cN_c + \gamma D(N_q - 1) + 0.5\gamma BN_\gamma \right] \frac{1}{F} + \gamma D$$

Here, F = Factor of safety (usually 3)

c = cohesion γ = unit weight of soil D = Depth of foundation

q = Surcharge at the ground level B = Width of foundation

N_c, N_q, N_γ = Bearing Capacity factors

Bearing capacity factors in zones of local, mixed and general shear conditions.

Local Shear Failure	Mixed Zone	General Shear Failure
$\phi < 28^\circ$	$28^\circ < \phi < 36^\circ$	$\phi > 36^\circ$
N_c^1, N_q^1, N_γ^1	N_c^m, N_q^m, N_γ^m	N_c, N_q, N_γ

Effect of Water Table fluctuation

The basic theory of bearing capacity is derived by assuming the water table to be at great depth below and not interfering with the foundation. However, the presence of water table at the foundation depth affects the strength of soil. Further, the unit weight of soil to be considered in the presence of water table is submerged density and not dry density. Hence, the reduction coefficients R_{w1} and R_{w2} are used in second and third terms of bearing capacity equation to consider the effects of water table

Density of soil :

In geotechnical engineering, one deals with several densities such as dry density, bulk density, saturated density and submerged density. There will always be a doubt in the student's mind as to which density to use in a particular case. In case of Bearing capacity problems, the following methodology may be adopted. Dry density as it does not change with season and it is always smaller than bulk or saturated density.

Factors Influencing Bearing Capacity

Bearing capacity of soil depends on many factors. The following are some important ones.

1. Type of soil
2. Unit weight of soil
3. Surcharge load
4. Depth of foundation
5. Mode of failure
6. Size of footing
7. Shape of footing
8. Depth of water table
9. Eccentricity in footing load
10. Inclination of footing load
11. Inclination of ground
12. Inclination of base of foundation

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TEMPLE

RH-1

RH-2

RH-3

ROAD

ROAD

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6	Recommendation:- The recommendations were made based on the field & Laboratory investigation and practical considerations for the proposed project.
	Recommended Allowable Safe Bearing Pressure T/Sq.M (shear failure and settlement 25mm) IS 6403:1981)
	REPORT WITH RESPECT TO EXISTING GROUND LEVEL AS RL 0.00 M

DEPTH	1.0
MTS	T/SQ.MT
1.50	22.08
2.00	30.80
2.50	39.51
3.00	40.00

FOUNDATION RECOMMENDATION: - SHALLOW FOUNDATION.

GROUND WATER NOT ENCOUNTERED WITH IN THE DEPTH OF INVESTIGATION.

This report is only for the particular borehole locations executed as shown in the site plan.